

REVISIONS																
LTR	DESCRIPTION										DATE (YR-MO-DA)			APPROVED		
B	Convert to military drawing format. Split V_{IL} into temperatures. Change footnote 1/ in 1.3. Change I_{IL} in table I. Change propagation delays. Add footnotes to table I. Editorial changes throughout. Add CAGE 27014 to case 2. Add figure 4. Add V_{OH} at -0.4 mA. Delete I_{OH} , and I_{OL} . Change test conditions for I_{IL} , I_{IH} , and propagation delay times. Change in table II. Renumber figures.										1988 MAY 12			D. R. Cool		
C	Added test condition C to 4.2a(1) and 4.3.2b(1). Added vendor CAGE code 27014 to flat package. Editorial changes throughout.										1989 NOV 2			D. R. Cool		

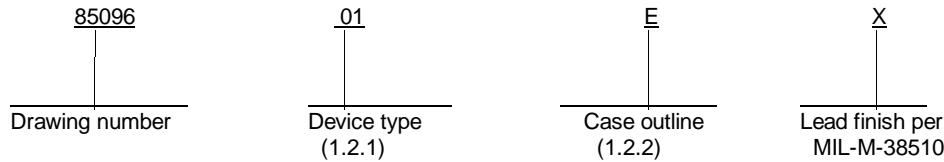
CURRENT CAGE CODE 67268

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REV STATUS OF SHEETS				REV		C	B	C	B	B	B	B	B	C	C															
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PMIC N/A				PREPARED BY Larry T. Gauder					DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444																					
STANDARDIZED MILITARY DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A				CHECKED BY Tim H. Noh																										
				APPROVED BY D. R. Cool																										
				DRAWING APPROVAL DATE 6 SEPTEMBER 1985																										
				REVISION LEVEL C					SIZE A		CAGE CODE 14933		85096																	
				SHEET		1				OF		12																		

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:



1.2.1 Device type. The device type shall identify the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit</u>
01	54ALS253	Dual 1 of 4 data selector/multiplexer with 3-state outputs

1.2.2 Case outlines. The case outlines shall be as designated in appendix C of MIL-M-38510, and as follows:

<u>Outline letter</u>	<u>Case outline</u>
E	D-2 (16 lead, .840" x .310" x .200"), dual-in-line package
F	F-5 (16 lead, .440" x .285" x .085"), flat package
2	C-2 (20 terminal, .358" x .358" x .100"), square chip carrier package

1.3 Absolute maximum ratings.

Supply voltage range	.....	-0.5 V dc minimum to +7.0 V dc maximum
Input voltage range	.....	-1.5 V dc at -18 mA to +7.0 V dc
Storage temperature range	.....	-65° C to +150° C
Maximum power dissipation (P_D) ^{1/}	.....	77 mW
Lead temperature (soldering, 10 seconds)	.....	+300° C
Thermal resistance, junction-to-case (θ_{JC})	.....	MIL-M-38510, appendix C
Junction temperature (T_J)	.....	+175° C

1.4 Recommended operating conditions.

Supply voltage range (V_{CC})	.....	+4.5 V dc minimum to +5.5 V dc maximum
Minimum high level input voltage (V_{IH})	.....	2.0 V dc
Maximum low level input voltage (V_{IL}):		
$V_{IL} = +125^\circ\text{C}$	.....	0.7 V dc
$V_{IL} = +25^\circ\text{C}$	.....	0.8 V dc
$V_{IL} = -55^\circ\text{C}$	.....	0.8 V dc
Case operating temperature range (T_C)	.....	-55° C to +125° C

^{1/} Maximum power dissipation is defined as $V_{CC} \cdot I_{CC}$, and must withstand the added P_D due to short circuit test; e.g., I_O .

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SIZE
A

85096

REVISION LEVEL
B

SHEET
2

2. APPLICABLE DOCUMENTS

2.1 Government specification, standard, and bulletin. Unless otherwise specified, the following specification, standard, and bulletin of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

BULLETIN

MILITARY

MIL-BUL-103 - List of Standardized Military Drawings (SMD'S).

(Copies of the specification, standard, and bulletin required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.2 Truth table. The truth table shall be as specified on figure 2.

3.2.3 Logic diagram. The logic diagram shall be as specified on figure 3.

3.2.4 Test circuit and switching waveforms. The test circuit and switching waveforms shall be as specified on figure 4.

3.2.5 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and shall apply over the full case operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table I.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		85096
		REVISION LEVEL C	SHEET 3

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions <u>1/</u> -55° C ≤ T _C ≤ +125° C, unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
High level output voltage	V _{OH}	V _{CC} = 4.5 V V _{IH} = 2.0 V V _{IL} at: +125° C = 0.7 V -55° C = 0.8 V +25° C = 0.8 V <u>2/</u>	I _{OH} = -0.4 mA	2.5		V
			I _{OH} = -1.0 mA	2.4		
Low level output voltage	V _{OL}	V _{CC} = 4.5 V I _{OL} = 12 mA V _{IH} = 2.0 V <u>2/</u>	V _{IL} = 0.7 V		0.4	V
			V _{IL} = 0.8 V			
Input clamp voltage	V _{IC}	V _{CC} = 4.5 V I _{IN} = -18 mA	1,2,3		-1.5	V
Low level input current	I _{IL}	Unused inputs ≥ 4.5 V V _{CC} = 5.5 V V _{IN} = 0.4 V	1,2,3		-0.1	mA
High level input current μA	I _{IH1}	V _{CC} = 5.5 V, V _{IN} = 2.7 V		1,2,3		20
		Unused inputs = 0.0 V				
mA	I _{IH2}	V _{CC} = 5.5 V, V _{IN} = 7.0 V		1,2,3		0.1
		Unused inputs = 0.0 V				
Output current	I _O	V _{CC} = 5.5 V V _{OUT} = 2.25 V <u>3/</u>	1,2,3	-30	-112	mA
Supply current	I _{CC}	V _{CC} = 5.5 V	Outputs enabled	1,2,3	12	mA
			Outputs disabled	1,2,3	14	mA
Off-state output current	I _{OZH}	V _{CC} = 5.5 V V _{OUT} = 2.7 V	1,2,3		20	μA
	I _{OZL}	V _{CC} = 5.5 V V _{OUT} = 0.4 V	1,2,3		-20	
Functional tests		See 4.3.1c <u>4/</u>	7,8			

See footnotes at end of table.

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SIZE
A

85096

REVISION LEVEL
B

SHEET
4

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ -55° C ≤ T _C ≤ +125° C, unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Propagation delay time, A, B to any Y	t _{PLH1}	V _{CC} = 4.5 V to 5.5 V C _L = 50 pF R ₁ = 500Ω R ₂ = 500Ω See figure 4 5/	9,10,11	5	22	ns
	t _{PHL1}		9,10,11	5	32	
Propagation delay time, any C to any Y	t _{PLH2}		9,10,11	2	12	ns
	t _{PHL2}		9,10,11	3	21	
Output enable time, G to any Y	t _{PZH}		9,10,11	3	16	ns
	t _{PZL}		9,10,11	2	22	
Output disable time, G to any Y	t _{PHZ}		9,10,11	2	10	ns
	t _{PLZ}		9,10,11	2	14	

1/ Unused inputs that do not directly control the pin under test must be ≥ 2.5 V or ≤ 0.4 V. No unused inputs shall exceed 5.5 V or go less than 0.0 V. No inputs shall be floated.

2/ All outputs must be tested. In the case where only one input at V_{IL} maximum or V_{IH} minimum produces the proper output state, the test must be performed with each input being selected as the V_{IL} maximum or the V_{IH} minimum input.

3/ The output conditions have been chosen to produce a current that closely approximates one half of the true short circuit output current, I_{OS}. Not more than one output will be tested at one time and the duration of the test condition shall not exceed 1 second.

4/ Functional tests shall be conducted at input test conditions of GND ≤ V_{IL} ≤ V_{OL} and V_{OH} ≤ V_{IH} ≤ V_{CC}.

5/ Propagation delay limits are based on single output switching. Unused inputs = 3.5 V or ≤ 0.3 V.

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SIZE
A

85096

REVISION LEVEL
B

SHEET
5

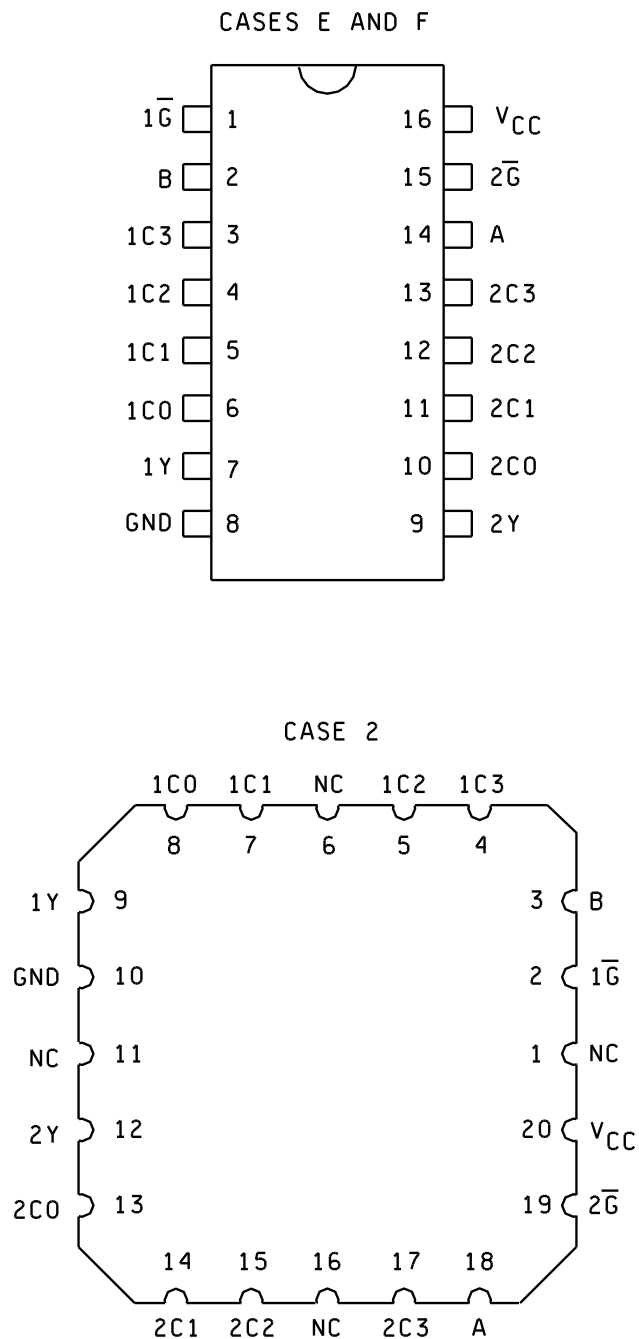


FIGURE 1. Terminal connections (top views).

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		85096
		REVISION LEVEL B	SHEET 6

Select inputs	Data inputs	Output control	Output
B A	C0 C1 C2 C3	\bar{G}	Y
X X	X X X X	H	Z
L L	L X X X	L	L
L L	H X X X	L	H
L H	X L X X	L	L
L H	X H X X	L	H
H L	X X L X	L	L
H L	X X H X	L	H
H H	X X X L	L	L
H H	X X X H	L	H

Address inputs A and B are common to both sections.

H = High level

L = Low level

Z = High impedance

X = Irrelevant

FIGURE 2. Truth table.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		85096
		REVISION LEVEL B	SHEET 7

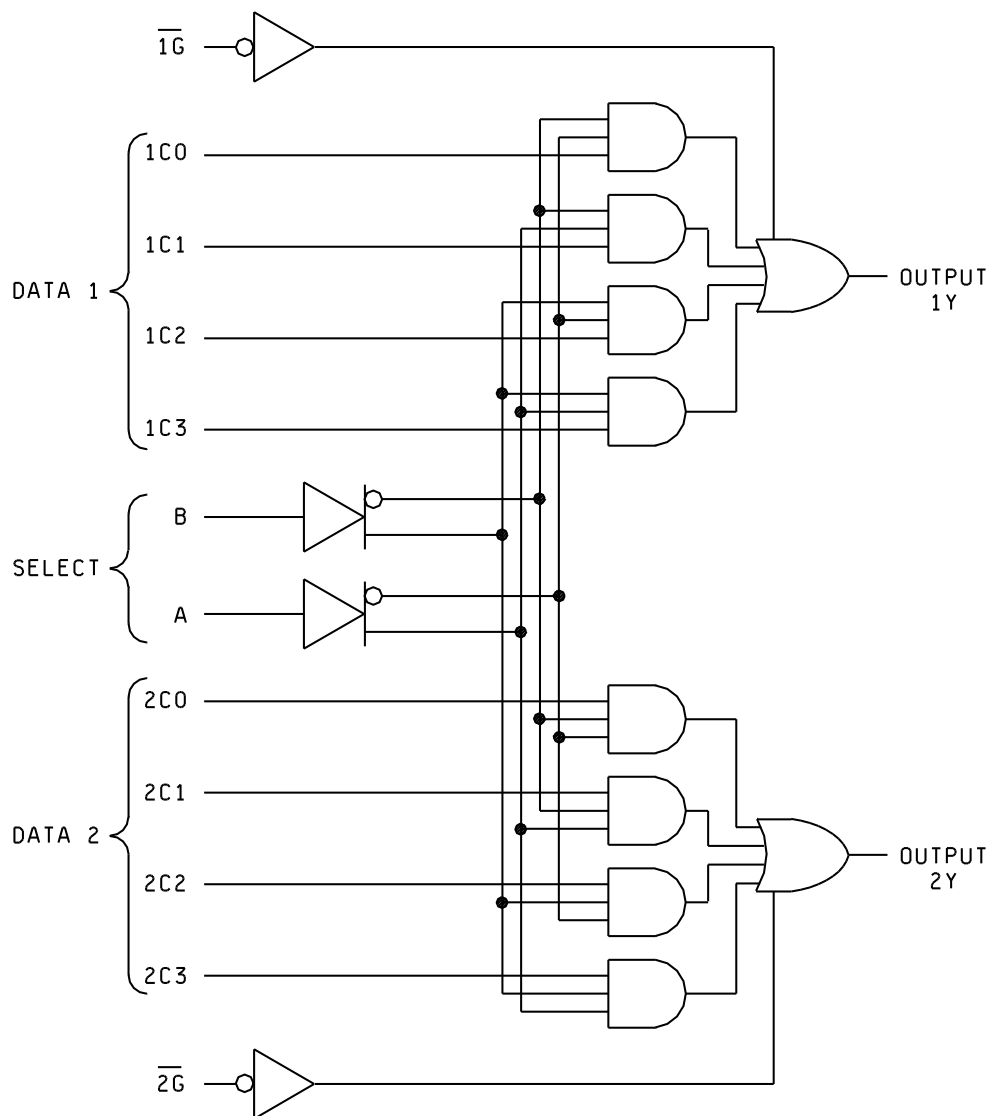


FIGURE 3. Logic diagram.

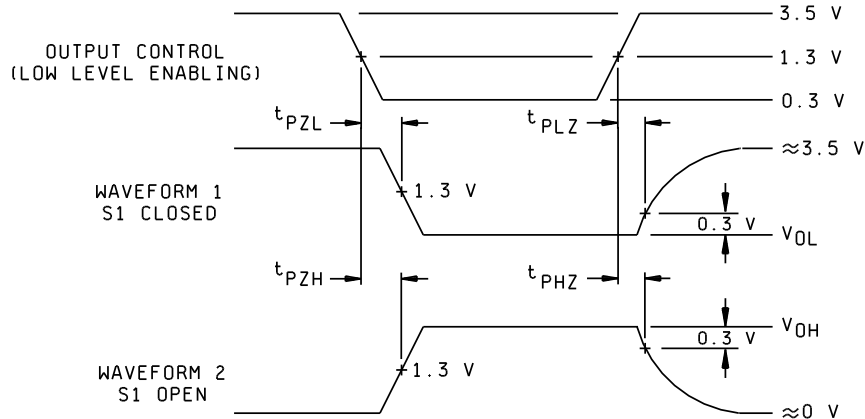
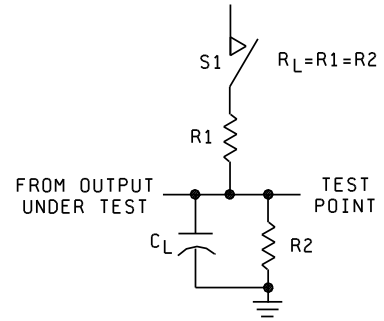
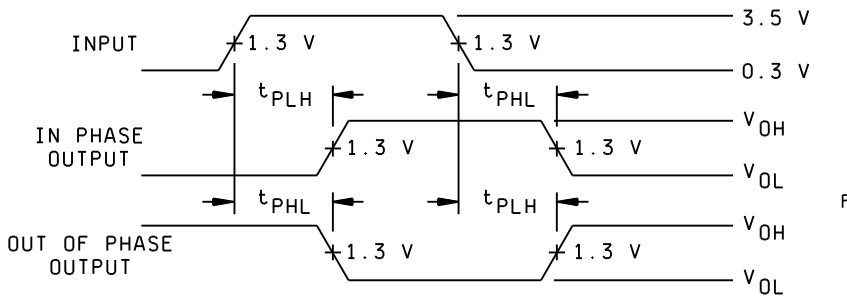
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SIZE
A

85096

REVISION LEVEL
B

SHEET
8



NOTES:

1. C_L includes probe and jig capacitance.
2. All input pulses have the following characteristic: $PRR \leq 10$ MHz, duty cycle = 50%, $t_r = t_f = 3$ ns ± 1 ns.
3. The outputs are measured one at a time with one input transition per measurement.
4. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.
Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
5. When measuring propagation delay items of 3-state outputs, switch S1 is open.

FIGURE 4. Test circuit and switching waveforms.

**STANDARDIZED
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DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

SIZE
A

85096

REVISION LEVEL
C

SHEET
9

3.5 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in MIL-BUL-103 (see 6.6 herein).

3.6 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-BUL-103 (see 6.6 herein). The certificate of compliance submitted to DESC-ECC prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DESC-ECC shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.9 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).

(2) $T_A = +125^\circ\text{C}$, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 7 and 8 tests shall include verification of the truth table.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		85096
		REVISION LEVEL C	SHEET 10

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	---
Final electrical test parameters (method 5004)	1*,2,3,7,8,9, 10,11
Group A test requirements (method 5005)	1,2,3,7,8,9, 10,11
Groups C and D end-point electrical parameters (method 5005)	1,2,3

* PDA applies to subgroup 1.

4.3.2 Groups C and D inspections.

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test conditions, method 1005 of MIL-STD-883.
 - (1) Test condition A, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).
 - (2) $T_A = +125^\circ\text{C}$, minimum.
 - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-481 using DD Form 1693, Engineering Change Proposal (Short Form).

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		85096
		REVISION LEVEL C	SHEET 11

6.4 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DESC-ECC, telephone (513) 296-6022.

6.5 Comments. Comments on this drawing should be directed to DESC-ECC, Dayton, Ohio 45444, or telephone (513) 296-8525.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-BUL-103. Additional sources will be added as they become available. The vendors listed in MIL-BUL-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-ECC. The approved sources of supply listed below are for information purposes only and are current only to the date of the last action of this document.

Military drawing part number	Vendor CAGE number	Vendor similar part number <u>1/</u>
8509601EX	01295 27014	SNJ54ALS253J 54ALS253J/883
8509601FX	01295 27014	SNJ54ALS253W 54ALS253W/883
85096012X	01295 27014	SNJ54ALS253FK 54ALS253E/883

1/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

Vendor CAGE
number

01295

27014

Vendor name
and address

Texas Instruments, Incorporated
P. O. Box 655012
Dallas, TX 75265
Point of contact: I-20 at FM 1788
Midland, TX 79701

National Semiconductor
2900 Semiconductor Drive
Santa Clara, CA 95051

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MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444**

SIZE
A

REVISION LEVEL
C

85096

SHEET
12